优尚

YOUSHANG SEMICONDUCTOR

设计研发新型功率器件

各类小信号开关

中低压及高压大电流等场效应管

0755-83047638
ysbdt@szyoushang.cn
www.szyoushang.cn

企业微信二维码

企业QQ二维码

Features

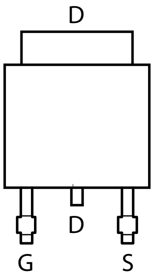
- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage

Mechanical Data

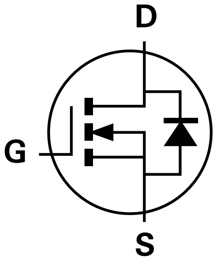
- Case: TO252-3L
- Case Material: Molded Plastic, “Green” Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: See Diagram Below
- Weight: 0.33 grams (approximate)

TO252-3L

Top View



PIN OUT -TOP VIEW



Equivalent Circuit

Maximum Ratings @T_A = 25°C unless otherwise specified

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V_{DSS}	30	V
Gate-Source Voltage			V_{GSS}	±20	V
Continuous Drain Current (Note 4) V_{GS} = 10V	Steady State	T_A = 25°C T_A = 85°C	I_D	11 8	A
Continuous Drain Current (Note 5) V_{GS} = 10V	Steady State	T_A = 25°C T_A = 85°C	I_D	16.5 12	A
Pulsed Drain Current (Note 6)			I_{DM}	48	A

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 4)	P_D	1.68	W
Thermal Resistance, Junction to Ambient @T_A = 25°C (Note 4)	$R_{\theta JA}$	74.3	°C/W
Power Dissipation (Note 5)	P_D	4.1	W
Thermal Resistance, Junction to Ambient @T_A = 25°C (Note 5)	$R_{\theta JA}$	30.8	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

Electrical Characteristics @T_A = 25°C unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 7)						
Drain-Source Breakdown Voltage	BV_{DSS}	30	-	-	V	V_{GS} = 0V, I_D = 250µA
Zero Gate Voltage Drain Current T_J = 25°C	I_{DSS}	-	-	1.0	µA	V_{DS} = 30V, V_{GS} = 0V
Gate-Source Leakage	I_{GSS}	-	-	±100	nA	V_{GS} = ±20V, V_{DS} = 0V
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	$V_{GS(th)}$	1.2	1.5	2.3	V	V_{DS} = V_{GS}, I_D = 250µA
Static Drain-Source On-Resistance	$R_{DS\ (ON)}$	-	5 8	7.5 12	mΩ	V_{GS} = 10V, I_D = 11.6A V_{GS} = 4.5V, I_D = 10.7A
Forward Transfer Admittance	$\|Y_{fs}\|$	-	22	-	S	V_{DS} = 15V, I_D = 15A
Diode Forward Voltage	V_{SD}	-	0.7	1.0	V	V_{GS} = 0V, I_{SD} = 2.1A
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C_{iss}	-	1289	-	pF	V_{DS} = 15V, V_{GS} = 0V, f = 1.0MHz
Output Capacitance	C_{oss}	-	187	-	pF	
Reverse Transfer Capacitance	C_{rss}	-	162	-	pF	
Gate Resistance	R_g	-	0.97	-	Ω	V_{DS} = 0V, V_{GS} = 0V, f = 1MHz
Total Gate Charge at 10V	Q_g	-	27.6	-	nC	V_{GS} = 10V, V_{DS} = 15V, I_D = 11.6A, Ig = 1.0mA
Total Gate Charge at 5V	Q_g	-	14.4	-	nC	V_{GS} = 5V, V_{DS} = 15V, I_D = 11.6A
Gate-Source Charge	Q_{gs}	-	3.6	-	nC	
Gate-Drain Charge	Q_{gd}	-	4.9	-	nC	
Turn-On Delay Time	$t_{D(on)}$	-	7.04	-	ns	V_{DD} = 15V, V_{GS} = 10V, R_G = 11Ω, I_D = 11.6A, R_L = 1.3Ω
Turn-On Rise Time	t_r	-	17.52	-	ns	
Turn-Off Delay Time	$t_{D(off)}$	-	36.13	-	ns	
Turn-Off Fall Time	t_f	-	19.67	-	ns	
Body Diode Reverse Recovery Time	t_{rr}	-	17.6	-	ns	I_F = 20A, dI/dt = 500A/µs
Body Diode Reverse Recovery Charge	Q_{rr}	-	65.9	-	nC	I_F = 20A, dI/dt = 500A/µs

Notes:
4. Device mounted on FR-4 PCB, with minimum recommended pad layout, single sided.
5. Device mounted on 2” x 2” FR-4 PCB with high coverage 2oz. copper, single sided.
6. Repetitive rating, pulse width limited by junction temperature and current limited by package.
7. Short duration pulse test used to minimize self-heating effect.
8. Guaranteed by design. Not subject to production testing.

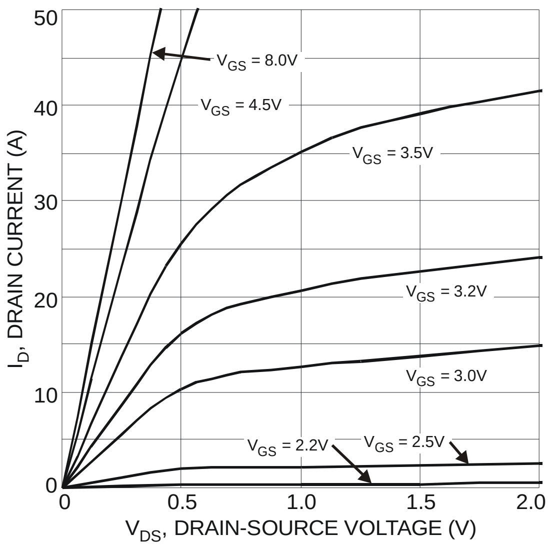


Fig. 1 Typical Output Characteristics

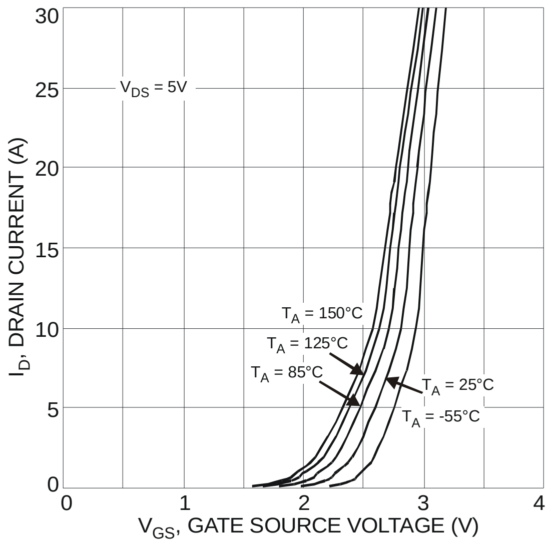


Fig. 2 Typical Transfer Characteristics

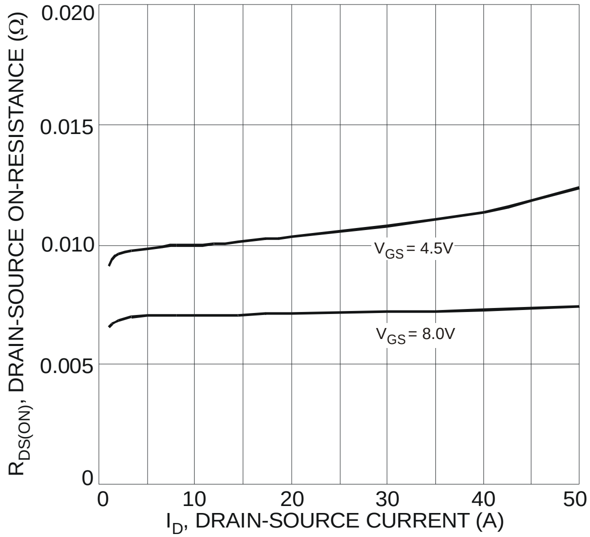


Fig. 3 Typical On-Resistance
vs. Drain Current and Gate Voltage

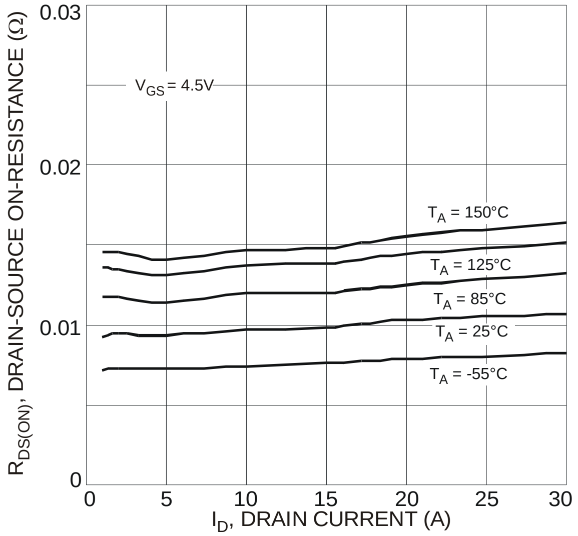


Fig. 4 Typical Drain-Source On-Resistance
vs. Drain Current and Temperature

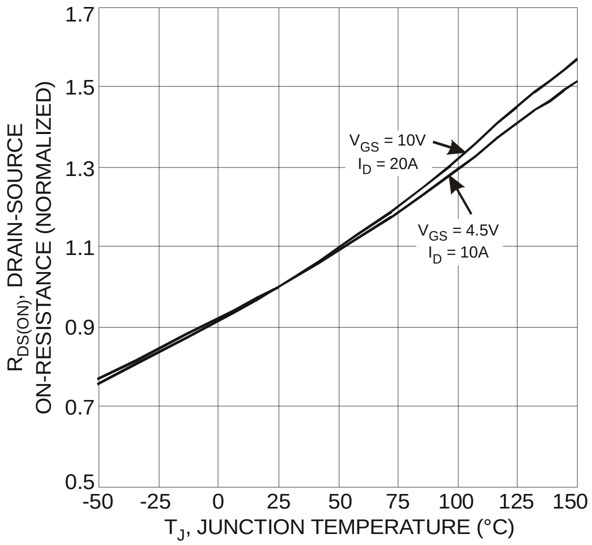


Fig. 5 On-Resistance Variation with Temperature

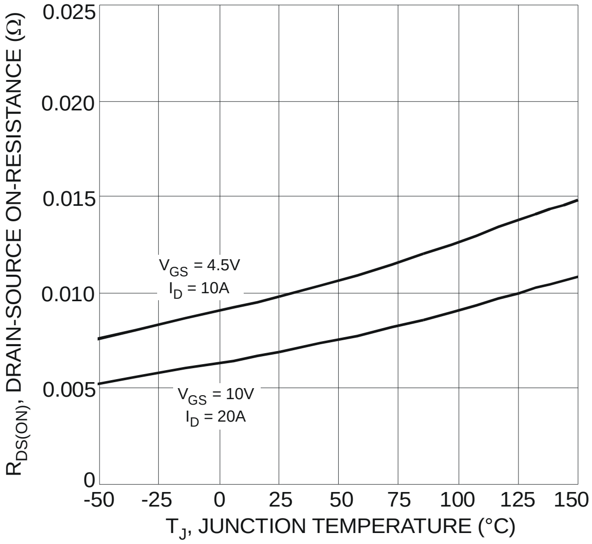


Fig. 6 On-Resistance Variation with Temperature

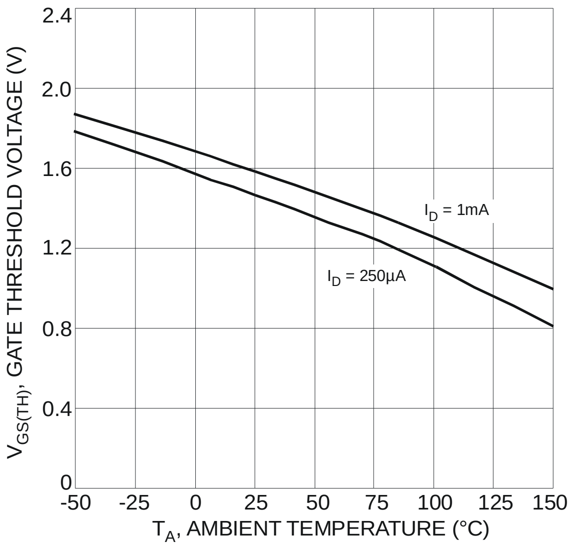


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

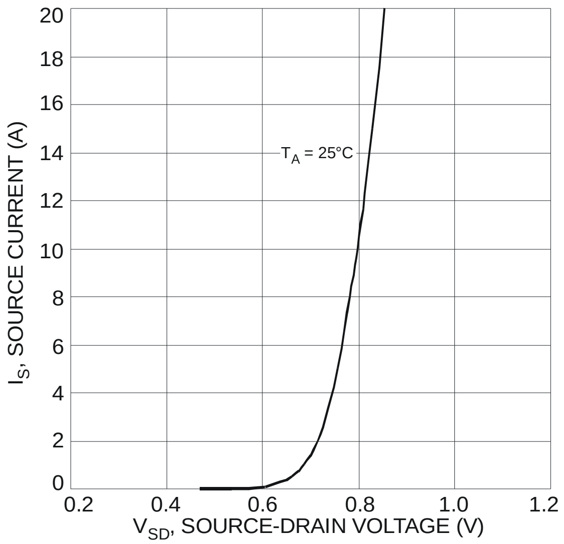


Fig. 8 Diode Forward Voltage vs. Current

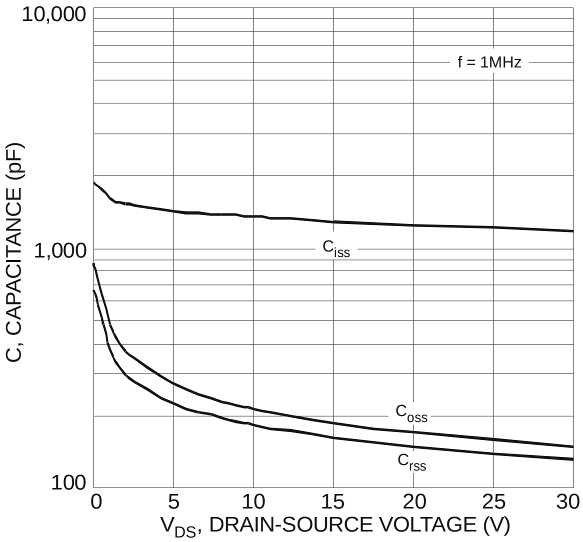


Fig. 9 Typical Capacitance

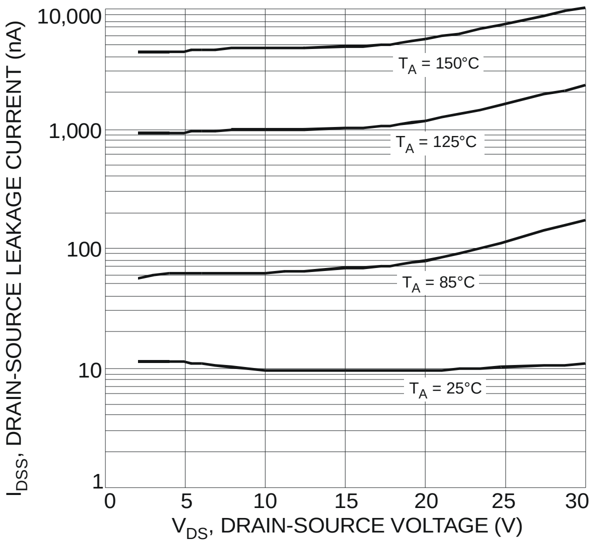


Fig. 10 Typical Drain-Source Leakage Current vs. Drain-Source Voltage

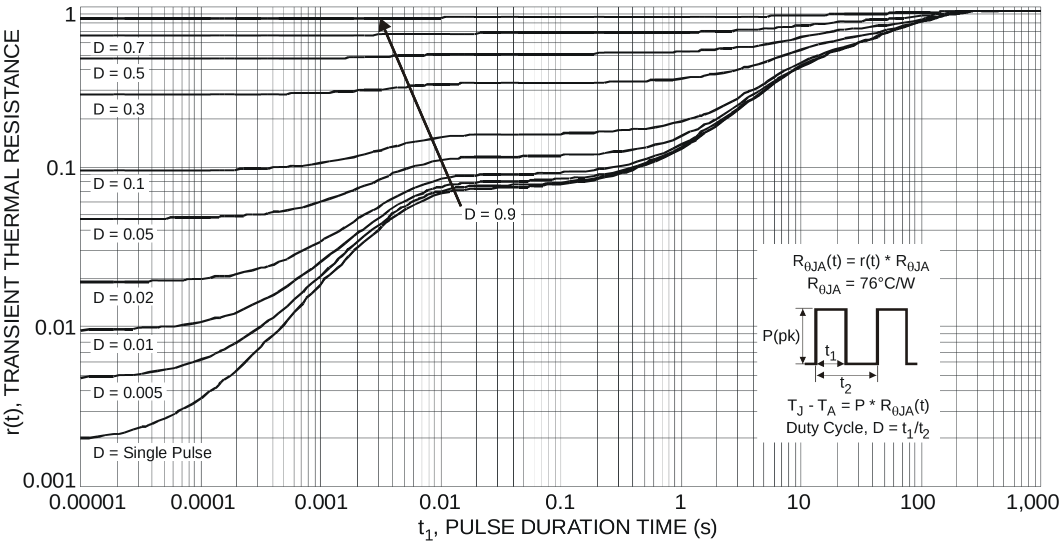
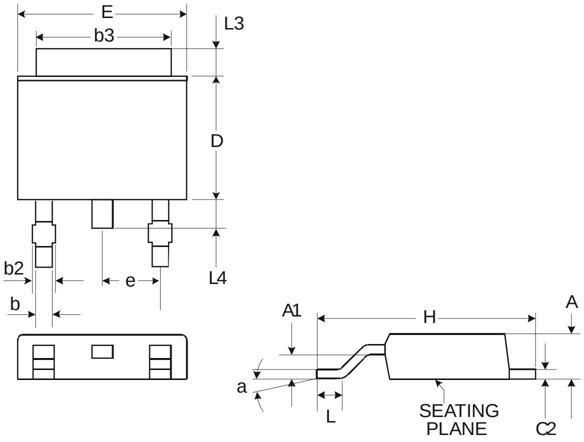


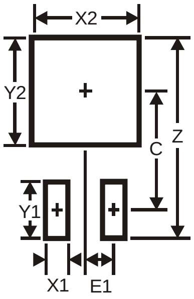
Fig. 11 Transient Thermal Response

Package Outline Dimensions



TO252-3L			
Dim	**Min**	**Typ**	**Max**
A	2.19	2.29	2.39
A1	0.97	1.07	1.17
b	0.64	0.76	0.88
b2	0.76	0.95	1.14
b3	5.21	5.33	5.50
C2	0.45	0.51	0.58
D	6.00	6.10	6.20
E	6.45	6.58	6.70
e	2.286 Typ.		
H	9.40	9.91	10.41
L	1.40	1.59	1.78
L3	0.88	1.08	1.27
L4	0.64	0.83	1.02
a	0°	-	10°
All Dimensions in mm			

Suggested Pad Layout



Dimensions	Value (in mm)
Z	11.6
X1	1.5
X2	7.0
Y1	2.5
Y2	7.0
C	6.9
E1	2.3